

REMARKS

In the Office Action, the Examiner rejected claims 1-5 and 7-11, 13-35, 37-39, 42-44, 46, 48, 50-52 and 53-54 under 35 USC § 102 and claim 1-2, 6-11, 13-18, 36, 41, 45, 47, 49 under 35 USC § 103. These rejections are fully traversed below.

Claims 1, 9, 19, 37, 42, 46, 50 and 52 have been amended. Claims 13-15, 18, 20-22, 34, 38, 40, 41 and 50 have been cancelled. Claims 55 and 56 have been added. Thus, claims 1-11, 16-17, 19, 23-33, 35-37, 39-40, 42-49 and 51-56 are pending in the application. Reconsideration of the application is respectfully requested based on the following remarks.

Claim Objections

Claim 20 has been cancelled.

ISSUES UNDER 35 USC 102

Claims 1-5, 7-11, 13-18 and 38-39 have been rejected under 35 U.S.C. §102(e) as being anticipated by *Li et al.*, U.S. Patent 6,070,551.

In contrast to *Li*, claim 1 (and its dependents) specifically requires, "...said gas flow system controlling flow of a single input gas comprising a mixture of etchant source gases into at least two different regions of said plasma processing chamber..." Accordingly, the rejection is unsupported by the art and should be withdrawn.

Also in contrast to *Li*, claim 1 (and its dependents) specifically requires, "...a gas inlet for receiving said single input gas that is to be delivered into said plasma processing chamber and at least first and second gas outlets configured to deliver the same said single input gas to at least two different regions including at least one peripheral region and at least one top region of said plasma processing chamber..." Accordingly, the rejection is unsupported by the art and should be withdrawn.

Also in contrast to *Li*, claim 1 (and its dependents) specifically requires, "...at least a first portion of said input gas being delivered to said plasma processing chamber via said first outlet

and a remaining portion of said input gas being delivered to said plasma processing chamber via said second outlet..." Accordingly, the rejection is unsupported by the art and should be withdrawn.

While *Li* may disclose center nozzles 56 and nozzles 34/34a, *Li* does not teach or suggest receiving an input gas through a gas inlet and delivering a portion of the input gas to the plasma processing chamber via first and second outlets. In *Li*, an individual gas source provides a gas directly to individual nozzles 56, 34 or nozzle 34a. In particular, first gas source 35 provides gas to nozzle 34, second gas source 35a provides gas to nozzle 34a and third gas source 58 provides gas to center nozzle 56. None of these gases are delivered into separate first and second nozzles. That is, each gas source has its own dedicated nozzle. They don't supply gas to any other nozzle.

The rejections to the dependent claims should also be withdrawn or at least the same reasons as above since these claims depend either directly or indirectly from the independent claim. Even in lieu of this, it should be noted that the dependent claims require additional features that are not taught in the cited reference.

Claims 19-20, 23-25, 28-30, 32-34, 42-44 and 53-54 have been rejected under 35 U.S.C. §102(b) as being anticipated by *Collins et al.*, U.S. Patent 6,024,826.

In contrast to *Collins*, claim 19 (and its dependents) specifically requires, "...said gas flow system controlling the flow of the same single input gas into at least two different regions of said plasma processing chamber." Accordingly, the rejection is unsupported by the art and should be withdrawn.

The rejections to the dependent claims should also be withdrawn or at least the same reasons as above since these claims depend either directly or indirectly from the independent claim. Even in lieu of this, it should be noted that the dependent claims require additional features that are not taught in the cited reference.

Claims 19-35, 37, 42-44, 46, 48 and 53-54 have been rejected under 35 U.S.C. §102(e) as being anticipated by *Muruges et al.*, U.S. Patent 6,228,781.

In contrast to *Muruges*, claim 19 (and its dependents) specifically requires, "...said gas flow system controlling the flow of the same single input gas into at least two different regions of said plasma processing chamber..." and claim 37 (and its dependents) specifically requires, "...said gas flow system controlling the release of the same input gas, associated with forming a plasma, into a first, a second and a third region within said plasma processing chamber." Accordingly, the rejection is unsupported by the art and should be withdrawn.

The rejections to the dependent claims should also be withdrawn or at least the same reasons as above since these claims depend either directly or indirectly from the independent claim. Even in lieu of this, it should be noted that the dependent claims require additional features that are not taught in the cited reference.

By way of example, claim 54 specifically requires, "...said peripheral region being located closer to said top surface than said substrate when said substrate is disposed inside said plasma processing chamber for processing..." In *Muruges*, gas ring 37 is located closer to substrate 17 than the top surface of chamber 13 (see Fig. 1A). Accordingly, the rejection is unsupported by the art and should be withdrawn. Also in contrast to *Muruges*, claim 55 specifically requires, "...said at least two different regions including a top central region, a lower peripheral region, and an upper peripheral region. While *Muruges* may disclose a gas delivery system 33 that provides gases to a chamber in locations of a gas ring 37 and a gas nozzle 45, *Muruges* does not teach or suggest providing gases from a third location as required by claim 55. In *Mureges*, gases are introduced into chamber 13 through gas ring 37 and a top nozzle 45 (see generally, Col. 6, lines 35-41). Accordingly, the rejection is unsupported by the art and should be withdrawn.

Claims 50-52 have been rejected under 35 U.S.C. §102(b) as being anticipated by *Li et al.*, U.S. Patent 6,009,830.

In contrast to *Li*, claim 50 (and its dependents) specifically requires, "...a plurality of outlets arranged to deliver the same said output gas to different locations within said plasma process chamber ..." Accordingly, the rejection is unsupported by the art and should be withdrawn.

The rejections to the dependent claims should also be withdrawn or at least the same reasons as above since these claims depend either directly or indirectly from the independent claim. Even in lieu of this, it should be noted that the dependent claims require additional features that are not taught in the cited reference.

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ISSUES UNDER 35 USC 103

Claim 6 has been rejected under 35 U.S.C. §103(a) as being unpatentable over *Li* (551) in view of *Wing* et al., U.S. patent 6,277,235.

Claims 6, 36 and 49 have been rejected under 35 U.S.C. §103(a) as being unpatentable over *Muruges* et al. U.S. patent 6,228,781, and further in view of *Wing*.

Claim 36 has been rejected under 35 U.S.C. §103(a) as being unpatentable over *Collins* in view of *Wing*.

In contrast to all these references, claim 6 specifically requires, "...wherein the input gas is released through the chuck." *Li*, *Muruges* and *Collins* are all silent to introducing a gas through a chuck (as indicated by the Examiner in the outstanding office action). And while *Wing* may disclose aperture 8 centrally located in the surface of the chuck 106, *Wing* does not teach or suggest flowing a source gas suitable for use to etch the substrate in the processing chamber 100 through the aperture 108. As further required in claim 1 from which claim 6 depends, "...said gas flow system controlling flow of a single input gas comprising a mixture of etchant source gases into at least two different regions of said plasma processing chamber " In *Wing*, gas such as He is supplied to the backside of the substrate from gas source 118 and aperture 108 to improve heat transfer and control substrate backside deposition (see Col. 3, lines 49-55). Accordingly, the rejection is unsupported by the art and should be withdrawn.

Similar arguments can be made for claims 36 and 49.

Claim 41 has been rejected under 35 U.S.C. §103(a) as being unpatentable over *Li* (551) in view of *Li* et al., U.S. patent 6,009,830.

Claim 41 has been rejected under 35 U.S.C. §103(a) as being unpatentable over *Muruges* in view of *Li* (830).

Claim 41 has been cancelled.

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Claims 45 and 47 have been rejected under 35 U.S.C. §103(a) as being unpatentable over *Muruges* in view of *Ueda et al.*, U.S. Patent 5,810,932 and further in view of *Kadomura*, U.S. Patent 6,096,160.

Claim 45 has been rejected under 35 U.S.C. §103(a) as being unpatentable over *Collins* in view of *Ueda* and *Kadomura*.

The rejections to claims 45 and 47 should be withdrawn for at least the same reasons as above. That is, *Ueda* and *Kadomura* do not overcome the deficiencies of *Muruges* or *Kadomura*. None of these references teaches or suggests the features described above with regards to claims 19 and 37 from which claims 45 and 47 respectively depend.

Claims 1-2, 7-11 and 13-18 have been rejected under 35 U.S.C. §103(a) as being unpatentable over *Muruges*.

In contrast to *Muruges*, claim 1 (and its dependents) specifically requires, "...said gas flow system controlling flow of a single input gas comprising a mixture of etchant source gases into at least two different regions of said plasma processing chamber ..." Accordingly, the rejection is unsupported by the art and should be withdrawn.

Double Patenting

These claims have been cancelled.

SUMMARY

Applicant believes that all pending claims are allowable and respectfully requests a Notice of Allowance for this application from the Examiner. Should the Examiner believe that a telephone conference would expedite the prosecution of this application, the undersigned can be reached at the telephone number set out below.

Respectfully submitted,
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